

SUMMARY

The Association of American Railroads ("AAR") supports the Commission's goal of alleviating frequency congestion and increasing spectrum efficiency in private land mobile radio ("PLMR") frequencies below 512 MHz. The railroads operate PLMR systems for critical safety and operational functions, collectively utilizing about 16,400 base stations nationwide with associated mobile and portable radios, telemetry devices and other equipment valued at more than \$576 million. The industry is committed to achieving greater spectrum efficiency in its own operations consistent with safety and interoperability requirements.

AAR encourages the Commission to adopt and promote "refarming" measures that provide PLMR users the greatest spectrum efficiency gains at the least cost. AAR supports the proposal to permit trunking and urges the Commission to ensure that sufficient channel pairs are available to enable users to implement trunking as soon as possible. In addition, AAR urges the Commission to continue exploring the option of making available a "green space" of clear spectrum with a very narrowband channel plan for users with voice-only requirements rather than imposing a very narrowband channel plan on all users.

AAR strongly urges the Commission to preserve the Railroad Radio Service as a separate service category with frequencies dedicated to railroad use and retain AAR as frequency coordinator. The railroads' unique interoperability and safety

requirements justify a separate service category. Unlike other PLMR users that operate in limited geographic areas, locomotives and equipment travel nationwide and must be able to communicate in terminals and train yards at every location. In addition, the critical safety functions of railroad communications, including transmission of information that could prevent a derailment, requires immediate access to assigned frequencies.

AAR opposes the Commission's plan for converting PLMR frequencies to a very narrowband channel plan because it imposes enormous burdens on PLMR licensees without a sufficient guarantee of spectrum efficiency benefits. The proposed 1996 deviation reduction would cost the railroad industry alone more than \$9 million but would yield very few new channels. Further, the FCC's plan for migration to very narrowband would require replacement of all existing equipment at least once, and probably twice in metropolitan areas, during the next two decades. AAR believes that, in addition to being costly, this proposal is imprudent because it is uncertain what technology will be available so far in the future.

AAR has developed an alternative proposal based on an "offset overlay" channel plan for achieving narrowband efficiency in the 150-174 MHz band which currently has 15 kHz spacing

channels available to users, providing immediate relief from spectrum congestion and enabling users to implement trunking. By 2008 to 2014, users in metropolitan areas that still are spectrum congested would be required to convert to very narrowband equivalent efficiency radio equipment.

Adopting the offset overlay plan would further the Commission's goals in this proceeding by increasing spectrum

that users be licensed to use no more power than necessary to support their operations. However, AAR opposes the Commission's proposed height-adjusted power limits because they preclude licensees from designing systems suited to their particular coverage areas. AAR would prefer no limits or a table of "safe harbor" limits, with the option to submit specific coverage contours, as proposed by the Land Mobile Communications Council.

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- Exhibit 1 - United States Map of Railroad Industry Radio Sites
- Exhibit 2 - Railroad Industry Cost Impact of Deviation Reduction
- Exhibit 3 - AAR and LMCC Narrowband Conversion Plan for UHF Band
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- Exhibit 12 - Map Depicting Degradation Due to NPRM ERP Limits
- Exhibit 13 - Railroad Industry Cost Impact of ERP Reduction

MAY 27 1993

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^{1/} Notice of Proposed Rule Making, 7 FCC Rcd 8105 (1992).

to the industry as a whole, including matters pertaining to regulation of communications. In addition, AAR functions as the frequency coordinator with respect to operation of land mobile and other radio-based services.

The railroads use Private Land Mobile Radio ("PLMR") services for critical safety and operational functions nationwide and are acutely aware of spectrum congestion problems, particularly in metropolitan areas. AAR's member railroads support the Commission's goal of promoting more efficient use of frequency bands below 512 MHz used by PLMR licensees and are committed to achieving greater spectrum efficiency in their operations, consistent with safety and operational requirements.

AAR applauds the Commission for stimulating creative thinking among all users and equipment manufacturers about how to relieve congestion and achieve spectrum efficiency. In the past few years, AAR and its member railroads formed a "Refarming Task Force," which has devoted a significant amount of time and effort to analyzing the Commission's "refarming" proposals as well as the various proposals by user groups and manufacturers. AAR filed comments and replies in response to the Notice of Inquiry in ~~DB Docket No. 01-1702/~~ and participated in the Commission's

narrowband equipment in order to evaluate the potential of such equipment to meet railroads' communications requirements. As a result of these efforts, AAR has concluded that, with appropriate modifications, certain proposals in the NPRM can result in benefits to all PLMR users and the public.

II. THE RAILROADS USE SPECTRUM BELOW 512 MHz FOR PLMR APPLICATIONS TO SUPPORT SAFE AND EFFICIENT OPERATIONS NATIONWIDE.

The railroad industry is a major user of land mobile radio communications operating on frequencies below 512 MHz that are the subject of this proceeding. The railroads operate PLMR facilities on 91 channels around 160 MHz and on 10 channels in the 450-470 MHz range.^{3/} On locomotives and rail equipment, along railroad tracks, and in stations, terminals and train yards across the nation, railroads currently utilize about 16,400 base stations, 45,000 mobile radios, 125,000 portable radios, 5,500 talking defect detectors, and 56,000 end-of-train, head-of-train devices and locomotive mobiles. The map of the United States attached as Exhibit 1 indicates the nationwide placement of the

^{3/} The frequencies allotted to the Railroad Radio Service are listed in Section 90.91(b) of the Commission's rules. 47 C.F.R. § 90.91(b). About one-third of the frequencies in

railroads' base stations. The current value of the railroad industry's land mobile radio facilities is estimated to be about \$576 million.

In the 1940s, the FCC established the Railroad Radio Service because of the highly specialized communications needs of the railroad industry and the importance of radio to the safe and efficient operation of the railroads.^{4/} Since then, the railroads have used land mobile frequencies for traditional functions such as end-to-end and wayside point-to-train communications. Mobile radio units with dedicated radio channels permit communications among dispatchers, yard crews, switch crews, signal technicians, mechanical and engineering crews and other personnel. Virtually all railroad employees involved in operations carry their own portable radios, in addition to using mobile radios installed in the railroads' vehicular fleet. Further, mobile units operating on channels with telephone interconnect capability permit ubiquitous communication throughout the public switched network.

Telemetry systems for remote control and defect detection also utilize PLMR frequencies. Various defect detectors, including hot wheel and hot journal detectors, are critical in preventing train accidents. For example, hot journal detectors measure the temperature of the axle bearings of a railroad car as

^{4/} See "Land Mobile Services," Memorandum Opinion and Order, 51 FCC 2d 945, 962-967 (1975) and General Mobile Radio Service, 13 FCC 1190, 1199-1204 (1949). Section 90.91 of the Commission's rules govern the Railroad Radio Service. 47 C.F.R. § 90.91.

it passes over the detector. A radio transmission then alerts the train crew to stop the train and inspect the journal to determine whether to remove the car in question or proceed at reduced speed. Similarly, hot wheel detectors identify railroad cars with malfunctioning brakes, which could lead to fires or other unsafe conditions.^{5/}

The railroads' use of PLMR frequencies has continued to grow as advanced specialized radio applications -- many unique to the railroad environment -- continue to expand. New uses will include data links for wayside equipment, mobile data terminals, remote switch indicators and controllers, wayside telephone, quality-of-ride for customer freight, and event recorder information from locomotives. Changes in railroad industry operations contribute to the expanded use of land mobile radio systems. For instance, radio telemetry devices are performing functions previously performed by caboose personnel. Other functions previously performed manually, such as flagging and delivery of track warrants and train orders, are now performed with PLMR equipment. Increased safety and redundancy requirements, automation and technological advances also are creating greater use of land mobile radio devices.

^{5/} Other radio-based detectors the railroads use include dragging equipment, wheel impact, high/wide, rock/land slide, flood and bridge status detectors.

III. THE COMMISSION SHOULD PRESERVE THE RAILROAD RADIO SERVICE AND RETAIN AAR AS FREQUENCY COORDINATOR.

The Commission has proposed consolidating the existing 19 PLMR services and modifying the role of frequency coordinators. NPRM, 7 FCC Rcd at 8110-12 and Appendix A, 7 FCC Rcd at 8124-26. The Commission found that channel utilization is not consistent across the 19 user groups and concluded that consolidation is necessary "to realize the maximum benefits of the PLMR spectrum." NPRM, 7 FCC Rcd at 8110-11. Specifically, the Commission has proposed consolidation into three broad categories -- Public Safety, Non-Commercial, and Specialized Mobile Radio Service -- plus a General Category Pool, encompassing all three broad categories. NPRM Appendix A, 7 FCC Rcd at 8125. The railroads, along with other Industrial and Land Transportation licensees that operate PLMR systems for internal use, would be included in the Non-Commercial Radio Service. Id. Frequencies currently available to these users under their separate service categories would be available to all in the new Non-Commercial Radio Service. Any recognized coordinator would be authorized to conduct frequency coordination for any license applicants in the Non-Commercial Radio Service. NPRM, 7 FCC Rcd at 8111-12.

While AAR supports the Commission's objective of ensuring efficient channel utilization by PLMR user groups, AAR strongly opposes any change of the PLMR service categories and frequency coordinator functions that would deprive the railroads of exclusive use and control of the frequencies that are allotted to them. The national and international scope of the railroad

industry and the critical safety aspects of its mobile radio applications are unique among PLMR users and require a separate service category. Safety concerns also make sharing frequencies with other users problematic unless sharing is specifically coordinated by AAR. Accordingly, it would serve the public interest to preserve the Railroad Radio Service.

A. The Railroads' Unique Operational and Safety Requirements Justify a Separate Service Category and Frequency Coordinator.

Three unique aspects of the railroad industry and its PLMR applications justify preservation of the Railroad Radio Service as a separate service category with AAR as frequency coordinator. These include the need for nationwide interoperability of PLMR facilities, the critical safety functions of railroad PLMR applications and the railroad's role in facilitating international commerce.

1. Nationwide Interoperability

The railroads' operational requirements are unique among PLMR users because of the need for nationwide interoperability of trains and equipment owned by different railroad companies. While other PLMR users operate within fixed geographic areas, railroads operate nationwide. Locomotives and other rail vehicles owned by each railroad travel over the tracks and through stations and terminals operated by other railroad companies. To ensure safety and interoperability, it is imperative that radio communications equipment be compatible at

all locations.

The map attached as Exhibit 1 is color-coded to indicate the nationwide placement of base stations of individual railroad companies. Numerous locations, especially in the East, are served by many different railroads. Although each railroad company is autonomous, together the railroads comprise a single nationwide network. The AAR has been a vital link for all railroads by coordinating the channel usage and ensuring that trains operated by various railroads can communicate with dispatchers, yard crews and other personnel at all stations and on all tracks throughout the country.

Maintaining interoperability will be especially difficult in a "refarming" environment, making it all the more important that the railroads retain a separate service category in order to meet their unique requirements. Narrowband and other spectrum efficient measures probably will be implemented more rapidly in metropolitan areas than in rural areas, and individual railroad companies will equip locomotives with new equipment at different times. Thus, it will be necessary that equipment be backward compatible as well as interoperable with all base stations across the nation.

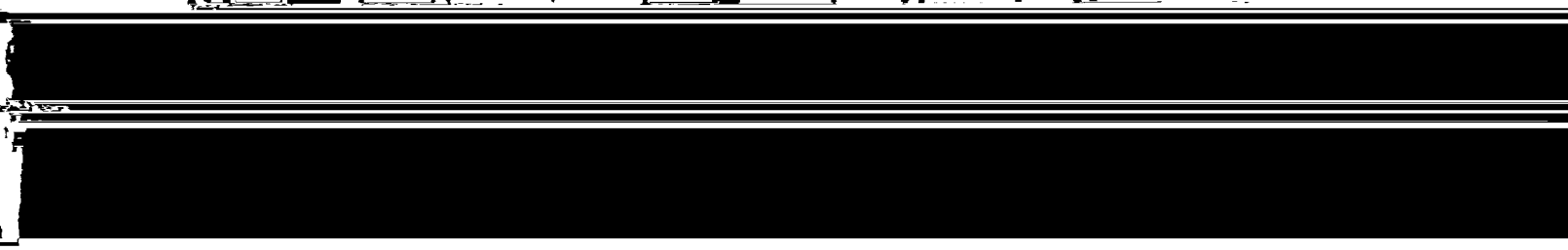
2. Safety Requirements

The railroad industry also is unique among PLMR users because of the critical safety functions its land mobile radio facilities serve. The simple fact that railroad operations involve movement of heavy equipment, sometimes carrying

passengers and/or dangerous commodities, at high speeds highlights the serious nature of the railroads' safety concerns. The movement of a single locomotive picking up, transporting and delivering freight to various locations along a regional or nationwide route presents potential dangers to the public, as well as railroad employees, that cannot be underestimated.

The inherent dangers of rail operations are greatly minimized because of radio communications systems operated pursuant to the Railroad Radio Service and coordinated by AAR. For example, uniform channel assignments for similar applications permit any railroad's locomotive at any location throughout the nation to communicate with: (1) dispatchers issuing track warrants authorizing it to proceed on a given stretch of main line track; (2) yard masters and switch crews engaged in assembly and disassembly of trains; and (3) crews servicing wayside equipment. In addition, defect detectors and other telemetry devices permit immediate transmission of information regarding unsafe conditions.

An example of actual railroad operations demonstrates the great importance of radio communications in ensuring the safety and efficiency of such operations. A typical 10-hour train movement on May 4-5, 1993, by Consolidated Rail Corporation ("Conrail") was randomly selected for the purposes of



Amtrak's Northeast Corridor operations as well as New Jersey Transit's commuter service.

Conrail's Train YPSA60 departed from its South Amboy, New Jersey, terminal at 11 p.m. with a work order to move 14 loaded and 44 empty tank cars to Manville, New Jersey, yard, an area known as the "Chemical Coast" because many trains consist of tank cars used for petroleum products. The engineer took part in 27 conversations over four different voice channels with two different Conrail dispatchers, a New Jersey Transit dispatcher and an operator at Conrail's tower in Newark. Yardmasters controlled yard moves and additional work assignments as the YPSA60 arrived and departed yards at Manville, Oak Island, Port Newark and Bayway, New Jersey.

In addition to exchanges with dispatchers and yard supervision, voice communications between the engineer, conductor and brakemen occurred almost constantly during the time cars were spotted at customers' locations or picked up enroute. Ground crews used portable radios to guide movements during shifting of cars to ensure safety of personnel and prevent collisions.^{6/}

The critical role of radio communications in preventing loss of life and property, as illustrated by the foregoing Conrail example, was recognized by the Commission in 1944 when it

^{6/} The YPSA60's route includes hundreds of grade crossings and many industrial sites, making vandalism of the train and cargo a constant threat. The crew and dispatcher often communicate directly with Conrail police or maintenance forces for assistance, although no such communication was necessary on the May 4-5 journey.

established the Railroad Radio Service as a separate service category. While noting that some railroad PLMR applications also enhance efficiency of operations, the Commission found significant the "purely safety aspect" of railroad radio use:

[A] properly engineered railroad radio service would contribute to the safety of life and property, both in preventing rail accidents and in reducing the seriousness of injury and damage after accidents, by permitting the prompt summoning of aid.

General Mobile Radio Service, 13 FCC at 1199-1200. See also Frequency Allocation, Nongovernment, 39 FCC 33, 137-141 (1945) (summarizing testimony presented to Commission about railroad use of private radio communications).

Since that time, the public safety aspect of railroad use of radio communications has been a key component of FCC regulation of the Railroad Radio Service. The Commission's rules explicitly state that railroads are eligible to hold licenses "to operate radio stations for transmission of communications and to assure safety of operations essential to such activities of the licensee." 47 C.F.R. § 90.91(a) (emphasis added).^{1/} In 1966, the Commission authorized railroad use of PLMR frequencies for

^{1/} In contrast, the Commission's eligibility rules do not recognize a public safety component for many of the other PLMR service categories that the Commission has proposed be consolidated with the Railroad Radio Service. See, e.g. Power Radio Service, 47 C.F.R. § 90.63(a); Petroleum Radio Service, 47 C.F.R. § 90.65(a); Special Industrial Radio Service, 47 C.F.R. § 90.73(a); Business Radio Service, 47 C.F.R. § 90.75(a); Manufacturers Radio Service, 47 C.F.R. § 90.79(a); Motor Carrier Radio Service, 47 C.F.R. § 90.89(a); and Taxicab Radio Service, 47 C.F.R. § 90.93(a). While radio communications by users in other service categories may enhance safety of operations, public safety is not a key aspect of such communications.

"automatic, unattended, transmitting devices for detection of 'hot boxes,' that is, overheated journals, and other unsafe and malfunctioning equipment on railroad rolling stock." "Licensing of Unattended Stations Used in Conjunction with Right-of-Way Safety Inspection Devices," Report and Order, 5 FCC 2d 842 (1966). The Commission found that operation of defect detectors serve the "public interest, convenience and necessity" because these devices improve the safety of railroad operations. Id. at 843. Moreover, in the NPRM in this proceeding, the Commission noted the "imminent danger to the public safety" that would result from failure of "automated railroad systems." 7 FCC Rcd at 8110.

Although the railroads' radio facilities are licensed by the FCC, their operation also is regulated by the Department of Transportation ("DOT") because of their safety function. The DOT's Federal Railroad Administration ("FRA") has issued rules governing use of radio communications, including specific requirements for initiating and receiving transmissions, testing equipment, and information that must be included in a train order.^{8/} For example, Section 220.39 of the FRA's rules requires that engine and caboose radios be turned on and adjusted to receive communications whenever the engine or caboose is manned. 49 C.F.R. § 220.39. Section 220.49 requires that when radio communications are used in connection with switching, backing or pushing a train, engine or car, the railroad employees

^{8/} "Radio Standards and Procedures," 49 C.F.R. § 220.

coordinating the movement must "keep in continuous radio contact." 49 C.F.R. § 220.49. If radio communication is not maintained, "the movement shall be stopped immediately and may not be resumed until the . . . radio contact has been restored." Id.

Just last year, the U.S. Congress considered whether the federal government should mandate railroads' use of certain radio communication systems for safety purposes. The "Rail Safety Enforcement and Review Act," signed into law on September 3, 1992, requires the DOT to conduct an inquiry and report to Congress on the safety benefits of railroad radio communication devices and whether their use should be required by federal law. P.L. No. 102-365, 106 Stat. 972 (1992) (codified at 45 U.S.C. § 431 (1993)). The statute requires that the DOT's inquiry shall assess, at a minimum, the following:

- (1) the advantages and disadvantages of requiring that every locomotive (and every caboose, where applicable) be equipped with a railroad voice communications system capable of permitting a person in the locomotive (or caboose) to engage in clear two-way communications with persons on following and leading trains and with train dispatchers located at railroad stations;
- (2) a requirement that replacement radios be made available at intermediate terminals;
- (3) the effectiveness of radios in ensuring timely emergency response;
- (4) the effect of interference and other disruptions of radio communications on safe railroad operation;

- (5) how advanced communications technologies such as digital radio can be implemented to best enhance the safety of railroad operations;
- (6) the status of advanced train control systems that are being developed, and the implications of such systems for effective railroad communications; and
- (7) the need for minimum Federal standards to ensure that such systems provide for positive train separation and are compatible nationwide.

P.L. No. 102-365 § 11.

3. International Commerce

Another reason the railroad industry is unique among PLMR user groups is the special role of the railroads and their communications systems in facilitating international commerce. The Railroad Radio Service is required to share frequencies with Canadian railroads within about 75 miles of the international border. For years, AAR has worked successfully with representatives of Canadian railroads to coordinate channel usage to ensure safe and efficient transport of rail cars across the border without disruptions. Other PLMR service groups do not have users regularly crossing international borders. Retaining the Railroad Radio Service as a separate service category, and retaining AAR as the sole entity charged with implementing this bilateral arrangement, would prevent disruption of international commerce with Canada.

In sum, the railroads' nationwide interoperability and safety requirements, as well as international concerns, make the Railroad Radio Service significantly different from other PLMR

users. The nationwide coordination of channel assignments and equipment that permit railroad PLMR facilities to ensure public safety is possible only because the railroads function within their own distinct service category with AAR as coordinator. AAR's frequency coordinating personnel regularly observe operations on-site and are intimately familiar with railroad operations. Frequency coordinators other than AAR are not, and could not be expected to be, familiar with the railroads' unique requirements, and could not adequately coordinate railroad frequency applications, as the Commission has proposed. For all these reasons, consolidation of the Railroad Radio Service with other PLMR services would be impractical and detrimental to safe and efficient national and international railroad operations.^{2/}

**B. The Railroads Must Be Able to Coordinate
Shared Use of Frequencies to Ensure Safety of
Operations.**

Preserving the Railroad Radio Service also would enable the railroads to continue to share frequencies in a safe and spectrum efficient manner. Currently, AAR's member railroads share channels with Canadian railroad companies within about 75 miles of the international border. In addition, the railroads currently share with a variety of other PLMR users pursuant to the interservice sharing rules, particularly in rural areas not

^{2/} The many unique aspects of the railroads' PLMR operations make it imperative that the Commission establish a separate railroad subpart in the new Part 88. AAR is willing to provide the rules for such a railroad subpart.

served by rail. 47 C.F.R. § 90.176. These sharing arrangements are coordinated by AAR to ensure that non-railroad use of railroad channels does not impair the integrity of railroad operations and endanger public safety.

The Commission's proposal to consolidate the service pools

safety devices, such as trackside defect detectors, do not continuously transmit information on the channels assigned for their use, but they must have immediate access to such channels in the event of a defect. If the channel were not available, the relay of information that would prevent a derailment would be disrupted.

AAR believes that the railroads' unique safety applications requiring continued access to clear channels make it essential that the Commission permit the Railroad Radio Service to retain exclusive access to its allotted channels, subject to interservice sharing.^{11/} To the extent the Commission proposes loading requirements and other utilization standards as a condition of exclusivity (NPRM, 7 FCC Rcd at 8108-09 and Appendix A, 7 FCC Rcd at 8122-24), they should not apply to the Railroad Radio Service.

C. The Railroads Must Maintain Contiguous Spectrum In Order to Control Interference and Achieve Bandwidth Necessary for Data Transmission.

Consolidation of the service pools as proposed by the Commission would result in a loss of contiguous channels available for the Railroad Radio Service.^{12/} Contiguous

^{11/} The Railroad Radio Service would continue to accommodate users from other PLMR services with compatible operations in geographic areas where railroad frequencies have capacity.

^{12/} The proposed consolidation of the service pools would result in immediate loss of contiguous spectrum dedicated for railroad use. Also contributing to the long-term loss of
(continued...)